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KAISER ALUMINUM

KAISER ALUMINUM & CHEMICAL CORPORATION

May 12, 1983

State of Washington
Department of Ecology
E 103 Indiana
Spokane, WA 99207

Attention: Douglas Dunster

Gentlemen:

RE: TRENTWOOD EAST LANDFILL

Black dross from Trentwood's rotary barrel operation was disposed of on-site at the East Landfill between 1962 and 1969. An estimated 100,000 tons was buried at this location as part of a larger stream of inert wastes including refractory brick, clean soil, gravel and concrete. Disposal of these inert wastes at our East Landfill continues today under an exemption from county solid waste regulations.

Disposal of dross at this site was, however, discontinued in 1969 when complaints of salty tasting water first arose. The immediate problem was thought to be the hydraulic load from an adjacent gravel washing operation promoting leaching of our dross. This operation was discontinued and the quality of water improved to the point of eliminating user complaints. We were left with seasonally elevated chloride concentrations in our potable system which were not high enough to exceed the taste threshold.

In July, 1976, EPA promulgated regulations pursuant to the Safe Drinking Water Act which set an upper limit of 10 mg/l of nitrate-nitrogen in public water supplies. Trentwood began to monitor our supply wells for this parameter and consistently found levels which were higher than normal background concentrations. In 1979 and 1983 concentrations briefly exceeded the 10 mg/l value. Chloride levels have not exceeded the 250 mg/l Federal secondary standard in our production well but have gone as high as twice that amount in the monitoring well immediately downstream of the landfill. Background concentrations for nitrate-nitrogen and chloride are approximately 1.0 mg/l and 5.0 mg/l, respectively, in the Spokane/Rathdrum Prairie Aquifer as measured in unaffected wells both upstream and down-stream of our plant site. This problem, in addition, to a rapidly increasing awareness of groundwater quality in general, let to the installation of a monitoring well network at Trentwood during September and October, 1979. Initial analysis of data gathered from these wells was done by Sweet, Edwards & Associates in an August 1980 report (Attachment #1). They suggested the source of contamination was surface water recharge through buried black dross causing hydrolysis and subsequent nitrification of

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EAST LANDFILL
CLOSURE

aluminum nitrides, as well as direct leaching of chloride salts. They were then asked to recommend a solution to the problem and in November 1980, issued a second report (Attachment #2) which called for installation of a clay cap covered by loam topsoil for moisture storage and vegetative cover. This, it was felt, would eliminate a minimum of 90% of the potential percolation.

In April 1981, you visited the site as part of the "open dump" inventory program. Your follow-up letter indicated the site could be classed as an "open dump" because of its water quality impacts and that steps should be taken to properly close it out. (Attachment #3).

Two other consultants have been engaged to review certain aspects of this project. Esvelt Environmental Engineering was asked to review the geohydrology of the site. In their report (Attachment #4), received December 8, 1981, they agreed that the source of contamination was indeed the East Landfill. In addition, they indicated that collected run-off should be disposed of carefully in order to keep it from re-entering the fill area through lateral movement in gravel seams.

Emcon Associates was asked to review the geohydrology as well as alternative solutions. They too felt there was no doubt the buried dross was the source of contaminants in downstream wells and after reviewing cover alternatives, such as excavation, membrane liners and asphalt, they concluded that a clay cap was the most cost effective solution (Attachment #5).

Alternatives to a clay cap include no action, excavation, membrane liners, or an asphalt cover.

a) No Action - If no attempt is made to stop the leaching of dross at this site we can expect seasonal contamination of plant drinking water to continue. This contamination may periodically exceed Federal and State drinking water criteria.

b) Excavation - Complete removal of the buried dross was investigated. Since approximately 40,000 Yd^3 of target material is dispersed in a filled volume of approximately 260,000 Yd^3, the effort required to remove it would be considerable. Finding a suitable disposal site for the material locally would be difficult and expensive. It is questionable whether the County would accept this quantity of waste at its landfill. Even if they would, the disposal costs alone would exceed the estimated covering costs. Adding allowances for excavation and hauling could double or triple the proposed expenditure. This approach contemplates excavation only down to the bottom of the old pit. Recent soil profiles show the undisturbed deposits below the filled area to also be contaminated with leached salts. So even after excavation it would take some time for percolating surface water to wash these deposits clean, thus prolonging the water quality problem for an indefinite period.

c) Membrane Liners - Costs of installing a membrane liner are similar to those of a clay cap. At the shallow slopes being used here, however, any significant settling of the base material could result in ponding

on the liner surface. In addition, the seal would depend solely on the integrity of the liner material and it would be difficult to determine whether with time the liner had developed leaks. On the other hand, clay is to a large degree self healing. These systems are more appropriately used as bottom liners.

d) Asphalt cover - Costs for covering the site with asphalt are significantly higher than for clay. Disposal of run-off could be a difficult problem since little or no moisture retention would be available. This type of cover also requires more frequent and intensive maintenance than a clay cap to maintain its integrity.

The selection of clay as the cover material was made, therefore, because of its high degree of effectiveness, relatively lower costs, and lower maintenance requirements.

Sweet & Edwards (Attachment #2) recommended 1.5 feet of clay and two feet of topsoil. Emcon recommended two feet of clay and one foot of topsoil. The "state-of-the-art" in predictive equations for soil moisture retention is not precise. In addition, the depth of clay included in the design specification is subject to variability during actual construction, even with close supervision. Therefore, we selected two feet of clay as the design specification to be covered by a minimum of one foot of loam topsoil for moisture retention and vegetative cover. This conservative design was chosen considering the uncertainty involved.

Sweet & Edwards recommended a minimum 1% slope to promote run-off. Emcon suggested a 3% slope. The steeper slope will yield a higher run-off coefficient. This allows for less top soil to be used for moisture retention. We have chosen a 2% slope. The increase in random fill required can be somewhat offset by savings in topsoil requirements and through the substitution of existing stockpiled wastes for some of the rough grading material.

The cover will extend to the edge of our property boundary on the north and south sides and westerly to a point fifty (50) feet west of the edge of the old pit. This will reduce to an absolute minimum the possibility of infiltration and lateral movement of water through the buried black dross.

Disposal of run-off water will be entirely on property owned by Kaiser Aluminum. The percolation basin has been sized to accommodate the 50 year 24 hour rainfall in conjunction with a 10 inch snowmelt. I refer you to page 13 of the Engineering Calculations for documentation.

The site will be closed following this project. At that point all solid wastes produced by Kaiser Aluminum/Trentwood with the exception of native soil excavated on-site will be disposed of outside the boundaries of the aquifer sensitive area.

Attachments 6, 7, and 8 are the actual engineering specification, supporting calculations, and design drawings for the cover project. These were developed under separate contract with Pacific Environmental Consultants.

Shannon and Wilson provided the soils data for selection of potential clay sources.

We are seeking approval from your agency on two levels. First, we desire an endorsement of our proposal from an engineering standpoint. Second, we are requesting a five year exemption from the "open dump" remedies available to you under 40 CFR part 256.23 and 256.25. In addition, we seek a statement indicating you do not intend to use 90.48 RCW, WAC 173-201, or any other laws or regulations against us for water quality problems associated with the East Landfill during the five year period following completion of the project. This is necessary to allow sufficient time to completely evaluate the effects of the cover.

Sincerely,

Phil Williams

P. H. Williams
Environmental Engineer

PHW/sj

Attachments (8)

cc: Spokane County Health District
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Spokane, WA 99201